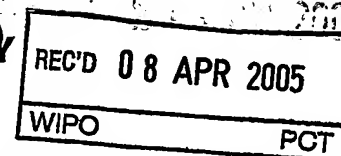


PATENT COOPERATION TREATY

PCT



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 17788PCT	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/DK2004/000002	International filing date (day/month/year) 07.01.2004	Priority date (day/month/year) 10.01.2003	
International Patent Classification (IPC) or national classification and IPC B28B21/28			
Applicant PEDERSHAAB A/S			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 3 sheets, as follows:</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 23.09.2004		Date of completion of this report 08.04.2005	
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Orij, J Telephone No. +31 70 340-4563	



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/DK2004/000002

Box No. I Basis of the report

~~1. With regard to the language, this report is based on the international application in the language in which it was~~
filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language ,
which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-12 as originally filed

Claims, Numbers

1-15 received on 03.03.2005 with letter of 28.02.2005

Drawings, Sheets

1/6-6/6 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-15
	No: Claims	
Inventive step (IS)	Yes: Claims	1-15
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-15
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

D1: US-A-5 051 223 (KERN GREGOR) 24 September 1991 (1991-09-24) cited in the application

D2: US-A-2 220 975 (AODHGAN O'RAHILLY) 12 November 1940 (1940-11-12)

- 2.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document) a method for the manufacture of concrete pipes comprising an outer layer, said outer layer forming the pipe itself, as well as an inner layer of greater density in surface structure, said inner layer being supplied by an applicator in a mould comprising inner as well as outer mould parts wherein the applicator is formed by an inner mould part or core (5) or by an applicator unit in direct connection with the core (figure, col. 1, l. 62 - col. 2, l. 34).

The subject-matter of claim 1 differs from this known D1 in that said applicator supplying the inner layer during simultaneous or during immediately following vibration

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

- 2.2 The problem to be solved by the present invention may be regarded as providing an inner surface material tightly bonded to the concrete pipe during its manufacture, in order to ensure a greater corrosion resistance.

The solution to this problem proposed in claim 1 of the present application is neither known, nor suggested by the available state of the art. The subject-matter of claim 1 is therefore considered as involving an inventive step (Article 33(3) PCT).

- 2.3 Claims 2-8 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

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~~3.1 The document D1 is regarded as being the closest prior art to the subject-matter~~
of claim 9, and shows (the references in parentheses applying to this document) an apparatus for the manufacture of concrete pipes by the method according to claim 1 or 2, where the applicator is formed by a core (5) which is intended to be moved in its longitudinal direction into the outer form (1), an upper end of said core (5) being provided with one or more annular grooves (13) wherein a further material with a *greater density (see paragraph VIII)* is supplied through one or more annular grooves (col. 2, l. 1-34)

The subject-matter of claim 9 differs from D1 in that an inner layer of *greater density (see paragraph VIII)* in the pipe structure is formed during vibration from a vibrator placed inside the core.

The subject-matter of claim 9 is therefore new (Article 33(2) PCT).

3.2 The problem to be solved by the present invention may be regarded as how to achieve the two materials to merge to a mutually denser structure and providing a tighter bond between the two materials (description, page 4, lines 19-21)

The solution to this problem proposed in claim 9 of the present application is neither known, nor suggested by the available state of the art. The subject-matter of claim 9 is therefore considered as involving an inventive step (Article 33(3) PCT).

4.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 10, and shows (the references in parentheses applying to this document) an apparatus for the manufacture of concrete pipes by the method according to claim 1 or 2, where the applicator is formed by a core (5) which is intended to be moved in its longitudinal direction into the outer form (1), an upper end of said core (5) being provided with a plurality of nozzles or gaps arranged at a short distance from each other in one or more grooves (13) along the circumference of the core (5, col. 2, l. 1-34), wherein a further material with a *greater density (see paragraph VIII)* is supplied through said plurality of nozzles or gaps.

The subject-matter of claim 10 differs from D1 in that an inner layer of *greater density (see paragraph VIII)* in the pipe structure is formed during vibration from a vibrator placed inside the core.

~~The subject-matter of claim 10 is therefore new (Article 33(2) PCT) and~~
considered as involving an inventive step (Article 33(3) PCT) for the same reasons
as mentioned in paragraph 3.2.

- 5.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 11, and shows (the references in parentheses applying to this document) an apparatus for the manufacture of concrete pipes wherein the applicator is formed by a core (5) which is intended to be rotated during forming or is rotated at completed forming

The subject-matter of claim 11 differs from this known D1 in that the core is provided with one or more grooves, said grooves being arranged such that they extend in the longitudinal direction of the core in one or more rows.

The subject-matter of claim 11 is therefore new (Article 33(2) PCT).

- 5.2 The problem to be solved by the present invention may be regarded as coating only a specific area of the inside of the concrete pipe

The solution to this problem proposed in claim 11 of the present application is neither known, nor suggested by the available state of the art. The subject-matter of claim 11 is therefore considered as involving an inventive step (Article 33(3) PCT).

- 5.3 Claims 12 and 13 are dependent on claim 11 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

- 6.1 The document D2 is regarded as being the closest prior art to the subject-matter of claim 14, and shows (the references in parentheses applying to this document) an apparatus for the manufacture of concrete pipes by the method according to claim 1 or 4, where the rotor (4) is arranged on the front of the core (2,5) relative to the direction of travel of the core (2,5), and that the rotor (4) is provided with supply means (11,12; fig. 1,2).

The subject-matter of claim 14 differs from this known D1 in that the further material is supplied to the inner surface of the pipe through the supply means during vibration from a vibrator placed inside the core.

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~~The subject-matter of claim 14 is therefore new (Article 33(2) PCT) and~~
considered as involving an inventive step (Article 33(3) PCT) for the same reasons
as mentioned in paragraph 3.2.

- 6.2 Claim 15 is dependent on claim 14 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
7. The subject-matter of claims 1-15 is considered as susceptible of industrial application (Article 33(4) PCT).

Re Item VII

Certain defects in the international application

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D2 is not mentioned in the description, nor is this document identified therein.

Re Item VIII

Certain observations on the international application

1. The relative term "greater density" used in claims 9 and 10 has no well-recognised meaning and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claims unclear, Article 6 PCT.
2. The following features "a further material with a greater desity ... during vibration" in the apparatus claims 9,10 and 14 relate to a method of using the apparatus rather than clearly defining the apparatus in terms of its technical features. The intended limitations are therefore not clear from this claim, contrary to the requirements of Article 6 PCT.
3. Claims 9-11,14 respectively have been drafted as separate independent claims of the same category. Under further reference to the PCT-Guidelines 5.15 and 5.42, it can not be deducted from these independently drafted claims which features are essential for the definition of the area for which protection is sought. The aforementioned claims therefore lack conciseness.

EPO - DG 1

03.03.2005

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(94)

AMENDED CLAIMS

1. A method for the manufacture of concrete pipes comprising an outer layer, said outer layer forming the pipe itself, as well as an inner layer of greater density in surface structure, said inner layer being supplied by an applicator in a mould comprising inner as well as outer mould parts, characterized in that the applicator is formed by an inner mould part or core (4) or by an applicator unit in direct connection with the core, said applicator supplying the inner layer during simultaneous or during immediately following vibration.
2. A method according to claim 1, characterized in that the inner layer is applied during movement of the inner mould part or core (4) in its longitudinal direction, said core (4) being formed with one or more supply openings (14) along the circumference of the core (4) at the upper end of the core (4) for the supply of a further material.
3. A method according to claim 1, characterized in that the inner layer is applied when the outer pipe (2) is formed in that the core (4) is rotated and a further material is applied through one or more supply openings (14), which essentially extend in the longitudinal direction of the core (4).
4. A method according to claim 1, characterized in that the inner layer is applied by an applicator in the form of a rotor (10) for the forming of a concrete pipe (2), in which rotor one or more supply openings (14) are provided in the part of the rotor (10) which faces away from the direction of travel of the rotor (10).
5. A method according to claims 1-4, characterized in that the inner layer is applied to a bottom ring (5) and/or a top ring (6) before said ring or rings are applied to the other mould parts.

6. A method according to claims 1-4, c h a r a c t e r i z e d in that the inner layer is applied to a bottom ring (5) and/or a top ring (6) when said ring or rings have been connected with the other mould parts and before the mould is filled with concrete (9).
- 5 7. A method according to claims 1-4, c h a r a c t e r i z e d in that the spigot end (7) of the pipe is provided with the inner layer in that a top ring or a profile ring (6) is lifted, the further material is filled over the spigot end (7) of the pipe (2), and then the profile ring (6) is lowered/pressed down over
10 the spigot end (7) during simultaneous or during immediately following vibration.
8. A method according to claims 1-7, c h a r a c t e r i z e d in that the further material may be in the form of a paste, powder or liquid.
- 15 9. An apparatus for the manufacture of concrete pipes by the method according to claim 1 or 2, where the applicator is formed by a core (4) which is intended to be moved in its longitudinal direction into the outer form (3), an upper end of said core (4) being provided with one or more annular grooves
20 (14) c h a r a c t e r i z e d in that a further material with a greater density is supplied through one or more annular grooves to form an inner layer of greater density in the pipe structure during vibration from a vibrator (12) placed inside the core (4).
- 25 10. An apparatus for the manufacture of concrete pipes by the method according to claim 1 or 2, where the applicator is formed by a core (4) which is intended to be moved in its longitudinal direction into the outer form (3), an upper end of said core (4) being provided with a plurality of nozzles or gaps arranged at a short distance from each other in one or more grooves (14)
30 along the circumference of the core (4), c h a r a c t e r i z e d in that a further material with a greater density is supplied through said plurality of nozzles or gaps to form the inner layer of greater density in the pipe

structure during vibration from a vibrator (12) placed inside the core (4).

11. An apparatus for the manufacture of concrete pipes by the method according to claim 1 or 3, c h a r a c t e r i z e d in that the applicator is formed by a core (4) which is intended to be rotated during forming or is rotated at completed forming, and that the core (4) is provided with one or more grooves (14), said grooves (14) being arranged such that they extend in the longitudinal direction of the core (4) in one or more rows.
12. An apparatus according to claim 11 for the manufacture of concrete pipes by the method according to claim 1 or 3, c h a r a c t e r i z e d in that the groove or grooves (14) extend in a straight line in the longitudinal direction of the core (4).
13. An apparatus according to claim 11 for the manufacture of concrete pipes by the method according to claim 1 or 3, c h a r a c t e r i z e d in that the groove or grooves (14) extend in a form of a spiral along the surface of the core (4) from one end of the core toward or to the other end of the core (4).
14. An apparatus for the manufacture of concrete pipes by the method according to claim 1 or 4, where the rotor (10) is arranged on the front of the core (4) relative to the direction of travel of the core (4), and that the rotor (10) is provided with supply means (14), c h a r a c t e r i z e d in that the further material is supplied to the inner surface of the pipe (2) through the supply means (14) during vibration from a vibrator (12) placed inside the core (4).
15. An apparatus according to claim 14 for the manufacture of concrete pipes by the method according to claim 1 or 4, c h a r a c t e r i z e d in that the supply means (14) provided on the rotor (10) are configured as nozzles and/or gaps.

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